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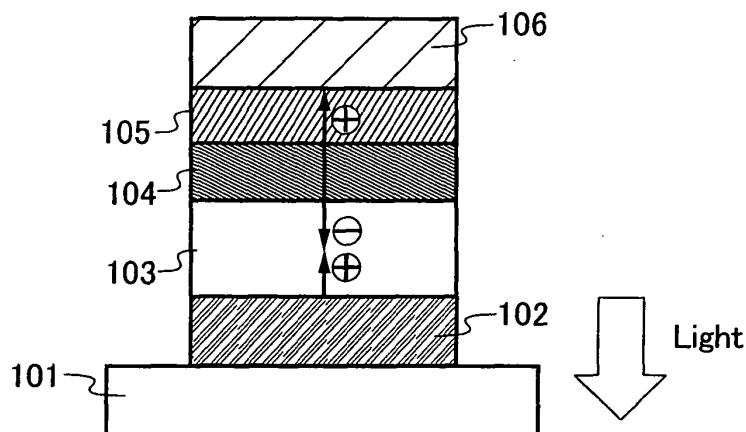
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(54) Light emitting element, light emitting device, and electronic device

(57) It is an object of the present invention to provide a light emitting element that realizes a high contrast. It is another object of the present invention to provide a light emitting device that realizes a high contrast by using the light emitting element with an excellent contrast. The light emitting element has a layer containing a light emitting substance interposed between a first electrode and a second electrode, and the layer containing the light emit-

ting substance includes a light emitting layer, a layer containing a first organic compound, and a layer containing a second organic compound. The first electrode has a light-transmitting property, and the layer containing the first organic compound and the layer containing the second organic compound are interposed between the second electrode and the light emitting layer. Furthermore, color of the first organic compound and color of the second organic compound are complementary.

FIG. 1





EUROPEAN SEARCH REPORT

Application Number
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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	J LEE ET AL: "High contrast ratio organic light-emitting devices based on CuPC as electron transport material", SYNTHETIC METALS, vol. 144, no. 3, 13 August 2004 (2004-08-13), pages 279-283, XP55013381, ISSN: 0379-6779, DOI: 10.1016/j.synthmet.2004.04.007 * abstract; figures 1,2 * -----	1,2,4,6, 7,23	INV. H01L51/52 H01L51/54
X	EP 1 256 989 A2 (EASTMAN KODAK CO [US]) 13 November 2002 (2002-11-13) * paragraphs [0016] - [0024] *	1,2,4,6, 7,23	
A	US 2006/006796 A1 (LEE SHI-HAO [TW] ET AL) 12 January 2006 (2006-01-12) * paragraphs [0017] - [0018] *	1-23	
A	CHIA-KUO YEN ET AL: "P-185: Black Electrode for Organic Light-Emitting Device", 2005 SID INTERNATIONAL SYMPOSIUM. BOSTON, MA, MAY 24 - 27, 2005; [SID INTERNATIONAL SYMPOSIUM], SAN JOSE, CA : SID, US, vol. XXXVI, 24 May 2005 (2005-05-24), pages 867-869, XP007012608, * the whole document * -----	1-23	TECHNICAL FIELDS SEARCHED (IPC)
			H01L
The present search report has been drawn up for all claims			
2	Place of search The Hague	Date of completion of the search 8 December 2011	Examiner Welter, Steve
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 07 00 4805

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

08-12-2011

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
EP 1256989	A2	13-11-2002	DE	60223443 T2		18-09-2008
			EP	1256989 A2		13-11-2002
			JP	2002343574 A		29-11-2002
			KR	20020086282 A		18-11-2002
			TW	533605 B		21-05-2003
			US	2002190638 A1		19-12-2002
<hr/>						
US 2006006796	A1	12-01-2006	CN	1674751 A		28-09-2005
			US	2006006796 A1		12-01-2006
<hr/>						